

A NEW SPECIES OF MYRIANGIUM ON PECAN

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(WITH PLATE 14)

On the living bark of the pecan, *Carya illinoensis*, in southern Mississippi, as well as elsewhere, probably throughout the entire range of the host, one finds a black fungus growth, sometimes in considerable abundance. It is quite superficial in character, occurring in the form of wart-like or knob-like tubercles on the unspotted and uninjured younger bark. But rarely, if ever, is it found on the rough, scaly portions, and never has it been observed growing on dead trees. It is found on all varieties of the host tree, more abundantly on those trees which have suffered somewhat from neglect and lack of proper care, but occasionally is abundant in thrifty, well-cared-for orchards. It has never been observed on the hickory, though it has been seen on pecan limbs and twigs which had been top-worked onto that tree.

Though quite superficial and apparently causing no injury to the host, the fungus is an object of considerable concern to growers in that it mars the appearance of their trees. It is the cause of numerous inquiries, and, therefore, it has been deemed worth while to devote some little attention to it. Although superficially described and pictured by McMurrin and Demaree,¹ the causal organism has never been determined.

MORPHOLOGY

The tubercles vary in size, ranging from 1 millimeter to 3 or 4 millimeters in diameter. The shape also varies, but isolated specimens usually approximate the hemispherical in form. Often a number of them are found crowded together, but rarely do they become confluent. The color varies from a very dark reddish-black to a coal-black. The surface is usually considerably con-

¹ McMurrin, S. M., and Demaree, J. B.: Diseases of Southern Pecans, U. S. Farmers' Bulletin No. 1129 (1920), p. 20.

voluted or verrucose, sometimes almost papillate, almost never smooth. The tubercles are solidly attached to the bark by a narrower, stipe-like portion which appears to penetrate through the outer corky portion into the living phloem tissue.

The inner portion of the tubercle is reddish-brown in color, and is densely and uniformly pseudoparenchymatic in structure, with a very thin, darker, crust-like layer on the outside. Occasionally streaks of slightly darker, thicker-walled cells will be found extending through this uniform tissue. Such streaks are usually located a short distance beneath the beginning of the loculiferous region. This portion, in which the asci occur, lies near the periphery of the tubercle, just beneath the crust-like layer, and on the outer side of each of the convolutions.

The locules are closely crowded together, often being separated by only one or two rows of the pseudoparenchymatous stromatic cells. They are subglobose to broadly ovate or oval in form and occur in several layers, some of the outer convolutions being almost entirely loculiferous. In microtome section this portion of the tubercle-like stroma has a very open, porous appearance. Even when cut with a knife in the natural condition while still attached to the tree, this locule-bearing tissue has a gray, powdery appearance in contrast to the dark brick-red or brownish-black of the solid, homogenous, sterile portion beneath it.

Each locule is lined with a thick, hyaline sheath, inside which occurs a single ascus. When the stroma is crushed and examined under the microscope, this sheath easily separates from the tissue of the stroma and remains about the ascus, giving the appearance of being merely a very thick ascus wall. If the sheath becomes ruptured, however, the ascus immediately expands, chiefly in a longitudinal direction, often to two or two and one half times its original length, becoming oblong, broadly spindleform, or ovate with blunt rounded ends, while the ruptured locule sheath collapses about its base. The ascus wall is quite thin as compared with this sheath, except at the apical end, where it is heavily thickened. There is no apical pore and the method of spore discharge has not been observed. Since the locules are indehiscent, and the pore at the apex of the ascus is absent, this probably is brought about by

the irregular rupture of the ascus wall. Each ascus contains eight spores. There are no paraphyses.

The locules average 50×50 – $50 \times 60 \mu$ while still in position in the stroma. When freed they become more oval in form, probably due to the expansion of the ascus on absorbing water, when they average 62 – $65 \times 40 \mu$. The ascus entirely fills the locule, but after the rupture of the sheath has occurred it becomes 90 – 95μ in length, contracting but little at its broadest part, the middle, but considerably toward each end.

The spores are multiseptate-muriform, large, oblong, and straight or sometimes slightly curved. They are seven- to eight-septate, with the middle septum much more definite than either of the others. There may be a slight constriction at either of the cross septa, but it is always more pronounced at this middle septum. The longitudinal septations are irregular, as are the others, with the exception of the middle one, dividing the spore into irregular somewhat cubical portions. When observed from the end in optical section the spore appears to be built about a very small, hollow central core, the segments being arranged about this very much in the manner of the grains on the cob of an ear of corn, when it, likewise, is observed from the end. The segments, however, are much fewer in number than in this latter case, the average number about the central core being 5 to 7. The spores average from 25 – 28μ in length by 10 – 11μ in breadth. They are ordinarily observed to be hyaline, but in quite mature specimens they have a very faint yellowish tint.

IDENTITY

The morphology of the fungus, especially the character of the indehiscent, monoascicular loculi scattered throughout or rather grouped toward the periphery of a pseudoparenchymatous stroma point at once to the family Myriangiaceae. The resemblance of members of this family to the Tuberales has been pointed out by Saccardo and Engler and Prantl. They exclude them from that order on account of their aërial, parasitic or saprophytic habit, and their general appearance. Von Höhnelt monographed this family in 1905 and places it in the Discomycetes close to the Tuberales.

The fungus appears to fall in the genus *Myriangium* as revised by Von Höhnelt, and since it does not agree with any species described under it, the following name is proposed:

***Myriangium tuberculans* sp. nov.**

Stromatibus tuberculi-formibus, primo immersis, demum superficialibus, solitariis vel gregariis, firmiter affixis, 1-3 vel 4 mm. diam., irregulariter hemisphaericis, ruguloso-verrucosis vel subpapillatis, interdum mutua pressione angulosis, atris, vel rufo-bruneis, intus atosanguineis, vel fusco-bruneis, contextu pseudo-parenchymaticis; loculis numerosis, subpolystichis, subperiphericis, globosis vel ovatis, monoascis, indehiscentibus; ascis subglobosis vel ovatis, crasse tunicatis, 8-sporis, aparaphasatis, 62-65 x 40 μ ; sporidiis oblongis, rectis vel leniter curvulis, utrinque obtusis, tranverse 7-septatis, muriformiter divisis, ad septa leniter constrictis, hyalinis, vel demum subflavidulis, 25-28 x 10 μ .

HABITAT: In cortice vivo *Caryae illinoensis*, Mississippi, America boreale.

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EXPLANATION OF PLATE 14

Fig. 1. (a) An expanded ascus with the ruptured sheath collapsed about its base; (b) an ascus with its spores, surrounded by the enveloping sheath which resembles a thickened ascus wall; (c) spores.

Fig. 2. Peripheral loculiferous portion of stroma as represented in figure 4, enlarged.

Fig. 3. Twigs of *Carya illinoensis* bearing the stromata of the fungus.

Fig. 4. Section through a stroma showing pseudo-parenchymatic structure and loculiferous region located near periphery.